

**SOLID AND HAZARDOUS WASTE MANAGEMENT SECTION
MEETING REPORT**

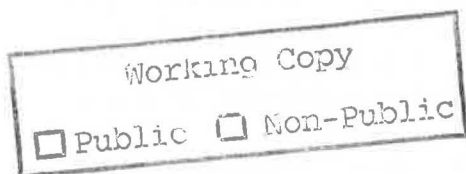
Prepared by: Melissa Ferree

MAF 3/31/15

Meeting Date and Location: February 18, 2015;
Bloom Energy – 200 Christina Parkway; Newark

ATTENDANCE:

Melissa A. Ferree, Engineer III, SHWMS
Karen G. J'Anthony, PMI, SHWMS
Nancy C. Marker, Program Administrator, SHWMS
Marjorie Crofts, Director, WHS
David Ormond, Deputy Attorney General, DOJ
Barry Sharpe, VP of Operations, Bloom Energy
Joe Tavi, Director of Manufacturing, Bloom Energy
Arne Ballantine, Director of Engineering, Bloom Energy
Bryan Horsey, Public Relations Manager, Bloom Energy



PURPOSE:

Tour of Bloom Energy Site

REFERENCE:

Bloom Energy; DEN201500008; File Code: 13

Background:

On January 22, 2015, the Department met with Bloom Energy representatives to discuss the regulatory status of used desulfurization canisters generated by Bloom Energy in its fuel cell servers. During the meeting, the Department requested a visit to the site to see Bloom's operations and observe its waste management practices.

Discussion:

On February 18, 2015, Department representatives arrived at the Bloom Energy Manufacturing Center in Newark at 9:00 AM for a tour of the site. Upon arrival, there was significant concern about the Department's reluctance to sign Bloom Energy's Non-Disclosure Agreement. Ultimately, it was decided that Department representatives would be given a tour, despite the agreement not being signed. Mr. Ormond explained the Department's confidentiality process in great detail and Bloom agreed to pursue that process if necessary.

Department representatives were then shown a safety video and given a brief history of the site and the mission of the company. The tour proceeded to a second floor mezzanine, where Mr. Ballantine explained the basics of how fuel cells work, including the chemical reactions that occur on the surfaces of the fuel cells to create ions, which are used to generate electricity.

Bloom representatives then provided an overview of where materials come in to the building and how the materials flow through the assembly plant. There was very little detail given as to the actual assembly process. SHWMS representatives observed several work stations. Each work station is set up for a separate function, with dedicated staff assigned to each station. Work stations included assembly, welding, insulation application, and testing of the final product.

All utilities are under the floor (rather than being hung from the ceiling). This allows for more even light distribution, which Bloom refers to as the "blue sky" effect. Additionally, it allows the assembly floor to be easily reconfigured, should reconfiguration be required as a result of business growth. The building has not been completely finished on the interior and is designed to be completed as the manufacturing process grows.

At the conclusion of the tour, Department representatives inquired about the desulfurization canisters, which had not been mentioned during the tour. Bloom representatives escorted Department representatives into another part of the building (not the main assembly area observed from the 2nd floor mezzanine) to observe an open module containing the desulfurization canisters. It was explained that there are four (4) desulfurization canisters in each module and the gas flows in series through each canister. When the canisters can no longer remove sulfur, they are removed. Mr. Ballantine explained that one (1) canister can be removed or all four (4) canisters can be removed; however, Bloom prefers to remove all four (4) canisters at the same time to minimize the opening and closing of the fuel cell module.

SHWMS representatives then inquired about the frequency of the canisters being removed, the weight of the canisters, and if the used canisters had ever been sent back to the Bloom manufacturing facility prior to shipment to Texas. Mr. Ballantine stated that the canisters are replaced every 6 months to 1 year and the canisters weigh 150 pounds. Mr. Tavi and Mr. Ballantine stated that used canisters had never been shipped back to the Bloom manufacturing facility in Newark prior to shipment to Texas. They then deferred questions regarding waste management, the amount of desulfurization waste generated, and the discrepancy between the number of canisters Bloom originally identified for shipment under a temporary EPA ID number versus the actual number requiring shipment to their environmental staff. Mr. Horsey seemed unaware that we intended to discuss waste management practices during the site tour, though he was present at the meeting in which the site tour was originally discussed and scheduled.